Course Title: Artificial Intelligence **Sheet #1**

The file ex1data1.txt contains the dataset for our sheet. The first column is the population of a city and the second column is the profit of a food truck in that city. A negative value for profit indicates a loss:

1. For the given dataset, use a 2D-plot to visualize the data , since it has only two properties to plot (profit and population).
2. The objective of linear regression is to minimize the cost function

$$J(\theta_0, \theta_1) = \frac{1}{2m} \sum_{i=1}^{m} \left(h_\theta(x^{(i)}) - y^{(i)} \right)^2$$

where the hypothesis hθ(x) is given by the linear model

$$h_\theta(x) = \theta_0 + \theta_1 x$$

For the given data set add another dimension to the data to accommodate the θ_0 intercept term. Also initialize the initial parameters to 0. Write a Matlab function computeCost to calculate J(θ)

3. Write a Matlab function to calculate J(θ) over a 2-dimensional grid of θ0 and θ1 values using the computeCost function you wrote in problem 2 then plot the cost function over this grid of values. After executing this function, you will have a 2-D array of J(θ) values.
Use these values to produce surface and contour plots of J(θ) using the surf and contour commands.

4. Repeat problems 1, 2, 3 using the data set given in the data file ex1data2.txt

Best wishes

Dr. Sherin El Gokhy